

from Port Stephen are very fine, they measure twenty-one lines long, breadth fourteen lines. From Lake Macquarie, fifteen lines long, ten lines broad. Sydney Heads, largest specimens eleven lines long, six lines broad; smallest specimens five lines long, three lines broad.

I quote Mr. Reeve's remarks on his so called species. "This shell may be chiefly distinguished from *Cardium Donaciforme* to which it is in many respects allied by the contracted flexuous prolongation of the posterior portion, and by the peculiarity of one half of the shell being conspicuously grooved whilst the other half is smooth and shining."

This description corresponds to about five specimens out of eighty-three; in old specimens there are very few grooves, others again have radiating grooves from end to end.

SPECIES OF EUCALYPTUS IN THE COUNTY OF CUMBERLAND: THEIR
HABITAT AND USES.

BY THE REV. DR. WOOLLS, D.D., F.L.S., &c.

Part IV.

Section IV. PACHYPHLOLE.

In referring to the species of this section, I think it necessary to state that I have always felt some difficulty respecting the trees popularly termed "Stringy Barks," for, though they differ in the size and shape of the leaves, the configuration of the fruit, and the comparative value of their wood, yet they all agree pretty well in the texture of their bark and the shape and opening of their anthers. Whether placed under the cortical or artificial system, therefore, they must stand close to each other. Until very recently, the specific name of *obliqua* was applied to all the forms of Stringy Bark, and it is very remarkable that Mr. Bentham, although he knew nothing of the trees excepting from dried specimens and the notes of the collectors, saw that they all

had a near alliance to that species (*E. obliqua*). Thus, in describing *E. capitella*, he remarks “nearly allied to *E. obliqua*, this species appears to differ slightly in the thicker leaves with rather less oblique veins, and more essentially in the sessile flowers and fruits, and in the shape of the fruit.” Of *E. macrorrhyncha*, he says, “Although allied to *E. obliqua*, this is readily distinguished by the buds, and especially by the shape of the fruit”; whilst of *E. eugenoides*, which he regarded as a variety of *E. piperita*, or the common Peppermint, he adds “This species is sometimes difficult to distinguish in the dried state from some forms of *E. obliqua*.” Under these circumstances, it seemed not unreasonable to regard the three forms of Stringy Bark, as varieties of the same species, differing from each other in proportion to their proximity to the sea-coast, their elevation above the sea-level, or the geological formation of the soil. This view appeared to be confirmed by the fact that Willdenow, in his “*Species Plantarum*” published in 1799, places *E. obliqua* amongst the Port Jackson Eucalypts, and also by the consideration that our early Botanists called the Stringy Bark by that name. It was not until the publication of the third Decade of Baron Mueller’s *Eucalyptographia* that the amalgamation of the forms under *E. obliqua* seemed untenable, for that learned writer proves beyond a doubt that the typical *E. obliqua* was first noticed in Tasmania, and that, in its ordinary form, it scarcely extends to New South Wales. Such being the case, it may be well, in the present state of our inquiries, to speak of the three forms of Stringy Bark found in different parts of the colony, as three distinct species. Very little importance should be attached to the shape and texture of the leaves or to the commercial value of the timber, as constituting specific difference, but there is a difficulty in combining forms which differ in the shape of their fruit. It is true, that in some species of Iron Bark (*E. siderophlora*) and of Mahogany (*E. resinifera*), the fruit varies sometimes in shape and size, but, then, the uniform shape of the leaves and the general

character of the wood prevent us from concluding that such deviations are anything more than varieties of the same species. With regard to size especially, this seems to be true, for, in damp sandy places near the coast, the fruit of the latter is sometimes three or four times as large as it is inland to the Blue Mountains.

1. *E. capitella*, (so called from the capitate flower buds of the umbels) is the common form of Stringy Bark near the sea-coast, and then, after passing over the county of Cumberland, it is found again on the Blue Mountains, where it is distinguished from the other form by the name of "Broad-leaved or Silvery Stringy Bark." As found near Sydney, it is only a tree of moderate size, but, according to Baron Mueller, it attains a height of 200 feet in favourable localities to the South. The young seedlings of this species, as well as those of *E. eugenoides*, and *E. macrorrhyncha*, are beset with minute tufts of hair, the leaves appear nearly opposite, and the fruit is hemispherical. This tree was one of the first Eucalypts made known to European Botanists, for it is figured in White's Voyages to New South Wales, and is described in Willdenow's "*Species Plantarum*," in which it is said to be distinguished from other species by its capitate flowers. The operculum is generally figured as hemispherical, but the form, especially near Sydney, varies to conical. With regard to the wood, different opinions are entertained, for, whilst Sir W. Macarthur (*Catologue of the Natural and Industrial Products of New South Wales*, 1867), says that the coast species is preferable to that of Camden, workmen generally speak more favourably of the kind which occurs as a forest tree between the coast and the mountains. Sir William gives 120 feet as the greatest height of *E. capitella*, and he mentions as a curious fact that the Blacks had different names for the coast and inland trees.

2. *E. eugenoides*, is the name now appropriated to the common Stringy Bark from Port Jackson to the Blue Mountains. As Mr. Bentham placed this species with *E. piperita*, there was some difficulty in identifying it, but recent investigation has shown that

it is the same as *E. scabra*, *E. penicellata*, and *E. acervula*, having narrower leaves than the other Stringy Barks, and differing also in the pale colour of the wood. The leaves are very unequal at the base and the fruit is small, not capitate, and the rim comparatively narrow. As a bush tree, Stringy Bark rises from 60 to 100 feet, and is associated with Box (*E. hemiphloia*) and Grey Gum (*E. tereticornis*), having frequently a spreading habit, and flowering regularly in the summer. It is a very useful tree, for the wood is available for flooring boards, weather boards, door-frames, shingles, fencing and paling, whilst the bark can be utilized not only for covering rustic buildings, but also for the manufacture of door-mats, paper, ropes, &c. I have been told by practical men that Stringy Bark Shingles have been known to last for 20 years, whilst a friend at Mudgee assures me that the same tree, (as distinguished from the Red Stringy Bark), furnishes a very durable timber, the posts of it having stood in the ground for 40 years. The quality, however, differs according to the soil, for, in some parts, it is not esteemed, whilst everywhere it is but an indifferent wood for fuel. According to Baron Mueller, to whom we are indebted for a technical description of the species under the name of *E. acervula*, it occurs from Botany Bay to the Macleay River, and is allied systematically to *E. piperita*.

3. *E. piperita*, is the common Peppermint of Port Jackson, so called, because in the early days of the colony, it was remarked that the volatile oil extracted from the leaves had in its scent a great resemblance to Peppermint. This tree which grows to great size, though generally spreading in its habit and not remarkable for its height, extends here and there from the coast to the Blue Mountains. Its bark which is not so fibrous or thick as that of Stringy Bark, covers the butt, but not the smaller branches, and on account of its greyish appearance, it is sometimes called, especially to the Southward, "White Stringy Bark." Differing from *E. capitella* and *E. eugenoides* in the shape of the fruit, the comparative thinness of the leaves, and in their less obliquity at

the base, there is also a marked dissimilarity in their seedlings, for whilst the leaves of the young Stringy Barks are rough, nearly opposite, and lanceolate, those of the Peppermint are smooth and roundish. Mr. Bentham considered *E. eugenioides*, or the White Stringy Bark to be a variety of *E. piperita*, but as the trees differ not only in the parts specified but also in their bark, wood, and habit, the opinion is inadmissible. The wood of the Peppermint has a bad reputation, being regarded as useless for fencing and carpentry, as well as for fuel. In the progress of inquiry, no doubt, it will be found applicable to some industrial purpose, but this is the character given to it by a recent writer: "Hard to kill, hard to grub, difficult to burn, and useless for all splitting purposes, it is a nuisance to the farmer, whether alive or dead." The occurrence of the Stringy Barks and Peppermint seems to be intimately connected with the geological formation of the soil, for whilst *E. capitella* and *E. piperita* prefer what is termed the Sydney sandstone or Hawkesbury Rocks, *E. eugenioides*, is the species found most frequently on the Parramatta Beds. Thus, for instance, *E. capitella*, is found in the neighbourhood of Port Jackson, and then, again on parts of the Blue Mountains where the formation is similar. The same remark may be made respecting *E. piperita*, for, though occurring at Manly Beach, on the Creeks to the north of Parramatta, and also on the rocky banks of the Parramatta River, it passes over a considerable portion of the County and appears again on the Blue Mountains. I am not aware that *E. macrorrhyncha* is to be found on this side of the Dividing Range, but, on the sides of the hills beyond Mudgee, it is one of the forms of Stringy Bark, preferring a porphyritic whinstone and felspar. This subject was discussed in a paper by Mr. W. Christie, read before the Royal Society in November, 1876, in which my eminent friend the late Revd. W. B. Clarke, took an especial interest, but as I did not see Mr. Christie's specimens, I can only observe, that one of the Stringy Barks in New England prefers "granite and elvanite soil," whilst

the other is found "where the rock approaches in its granular character to the nature of sandstone." The latter appears to me to be *E. macrorrhyncha*, as the seed vessel is reported to attain a large size, but in order to form any definite opinion of geological influences, the whole matter needs careful investigation.

*ON A YOUNG SPECIMEN OF A TEMNOPLEURUS.

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[Plate XV., figs. 3, 4, and 5.]

The species here described was dredged up from a few fathoms at Port Denison. It appears to me to belong to the genus *Temnopleurus*, and as far as I can judge belongs to a new species. It is principally distinguished by the extent and depth of the pits on the coronal plates. Unfortunately there are no perfect specimens and the anal system is entirely wanting. There are two single rows of large tubercles (primary) in each area, and secondaries are scattered in irregular double lines on the ridges between the sutural pits. On the ambulacral area this line is close to the pores, which are a single row of double pores. On the interambulacral area there is a very irregular line of secondaries between the line of pores and the row of primaries. The tubercles have a conspicuous smooth base and a rather large area which is also smooth. The sutural pits are regularly oval, and equally deep. The shape of the test is circular and depressed not conical. The actinosome is large, round, without cuts and the arches are broad, rather high, solid, united above and connected with one another by hood processes.

Prof. A. Agassiz has given us such full information about the young stages of *Temnopleurus* that we are able to pronounce at once upon any small urchins belonging to the genus. The specimen in question does not belong to *T. Hardwickii*, as in that species the sutural pits are altogether wanting on the actinal